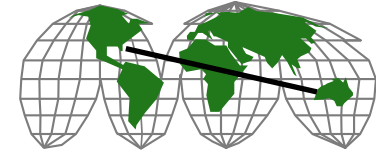


**AGREEMENT BETWEEN
THE GOVERNMENT OF THE UNITED STATES OF AMERICA
AND
THE GOVERNMENT OF AUSTRALIA
CONCERNING COOPERATION IN RADAR ACTIVITIES**



CONTENTS

- **BACKGROUND**
- **PARTICIPANTS**
- **FACILITIES**
- **OTH RADAR DESCRIPTION**
- **PROJECT ARRANGEMENTS**



BACKGROUN D

- **OVER-THE-HORIZON (OTH) RADAR PROGRAM IN UNITED STATES SINCE EARLY 1970s**
- **IN MID-1980s AUSTRALIA BEGAN EFFORTS TO BUILD AN OPERATIONAL OTH CAPABILITY AND INDICATED NEED FOR CONTINUED ALLIANCE WITH THE UNITED STATES**
- **MOA IN STAFFING BY BOTH GOVERNMENTS FOR OVER THREE YEARS**
- **SIGNED ON MARCH 3, 1992 IN SALISBURY, AUSTRALIA; IN FORCE FOR 10 YEARS**



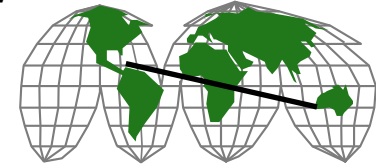
BACKGROUND (CONTINUED)

- **BILATERAL R&D AGREEMENT FOR COOPERATION IN RADAR ACTIVITIES**
- **FRAMEWORK FOR IN-DEPTH COOPERATION: CURRENT FOCUS ON LONG RANGE, HIGH FREQUENCY RADARS ALTHOUGH AGREEMENT IS NOT LIMITED TO THAT TOPIC**
- **RESEARCH INTO OTH RADAR LIMITATIONS: CLUTTER AND NOISE ASSOCIATED WITH CHANGING IONOSPHERIC PROPAGATION CONDITIONS SUCH AS TIME OF DAY, SEASONS, SUN SPOT CYCLES**
- **GOAL IS TO IMPROVE OPERATIONAL RADAR PERFORMANCE**



FRAMEWORK FOR COOPERATION

- **THE AGREEMENT PROVIDES A FRAMEWORK FOR COOPERATION IN RADAR-RELATED RESEARCH, DEVELOPMENT, TESTING AND EVALUATION, OPERATIONAL ANALYSIS, PRODUCTION AND PROCUREMENT, PROJECT MANAGEMENT, RADAR NETWORK OPERATIONS, TACTICAL COMMAND AND CONTROL, LOGISTICS SUPPORT, AND THE SHARING OF KNOWLEDGE RELATED TO THE OPERATIONAL USE OF RADAR AND ASSOCIATED TECHNOLOGIES**



US PARTICIPANTS

- **● OUSD/(A&T)/IPC/PAC -- US CO-CHAIR OF AGREEMENT STEERING COMMITTEE**
- **● ESC/DIA, HANSCOM AFB, MA -- DIRECTOR, AF PROJECTS**
- **● NAVAL SPACE COMMAND, DAHLGREN, VA - DIRECTOR, NAVY PROJECTS**
- **● FLEET SURVEILLANCE SUPPORT COMMAND, NORTHWEST, VA**
- **● AIR FORCE RESEARCH LAB, ROME, NY -- ARPA FOCAL POINT**
- **● MITRE CORPORATION, BEDFORD, MA**
- **● SPACE AND NAVAL WARFARE SYSTEMS CENTER, SAN DIEGO, CA**
- **● NAVAL RESEARCH LAB, WASH, DC**
- **● VARIOUS U.S. CORPORATIONS AND UNIVERSITIES**



AUSTRALIAN PARTICIPANTS

- **DIRECTOR, OPERATIONAL INFORMATION SYSTEMS
DEVELOPMENT, CAPABILITY DEVELOPMENT
DIVISION, AUSTRALIAN DEFENSE HEADQUARTERS,
CANBERRA, AUSTRALIA**
**-- AS CO-CHAIR,
AGREEMENT STEERING COMMITTEE**
- **WIDE AREA SURVEILLANCE DIVISION, DEFENCE
SCIENCE AND TECHNOLOGY ORGANISATION,
SALISBURY, SOUTH AUSTRALIA**
- **NO. 1 RADAR SURVEILLANCE UNIT, ALICE
SPRINGS, NORTHERN TERRITORY**



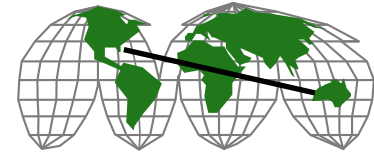
FACILITIES

- **USN RELOCATABLE OTH RADAR, NORTHWEST, VA AND SOUTH TEXAS**
- **ROME LAB AVA FACILITY (TRANSMIT FACILITY), AVA, NY**
- **USAF OTH-B EAST COAST RADAR SYSTEM, BANGOR, ME**
- **ROME LAB VERONA-AVA LINEAR ARRAY RADAR, VERONA, NY**
- **MITRE TEXAS FACILITY (RECEIVE ONLY SITE), WINK, TX**
- **SRI INTERNATIONAL WIDE APERTURE RADAR FACILITY (WARF), LOS BANOS, CA**
- **INDALEE OTH RADAR, ALICE SPRINGS, AUSTRALIA**



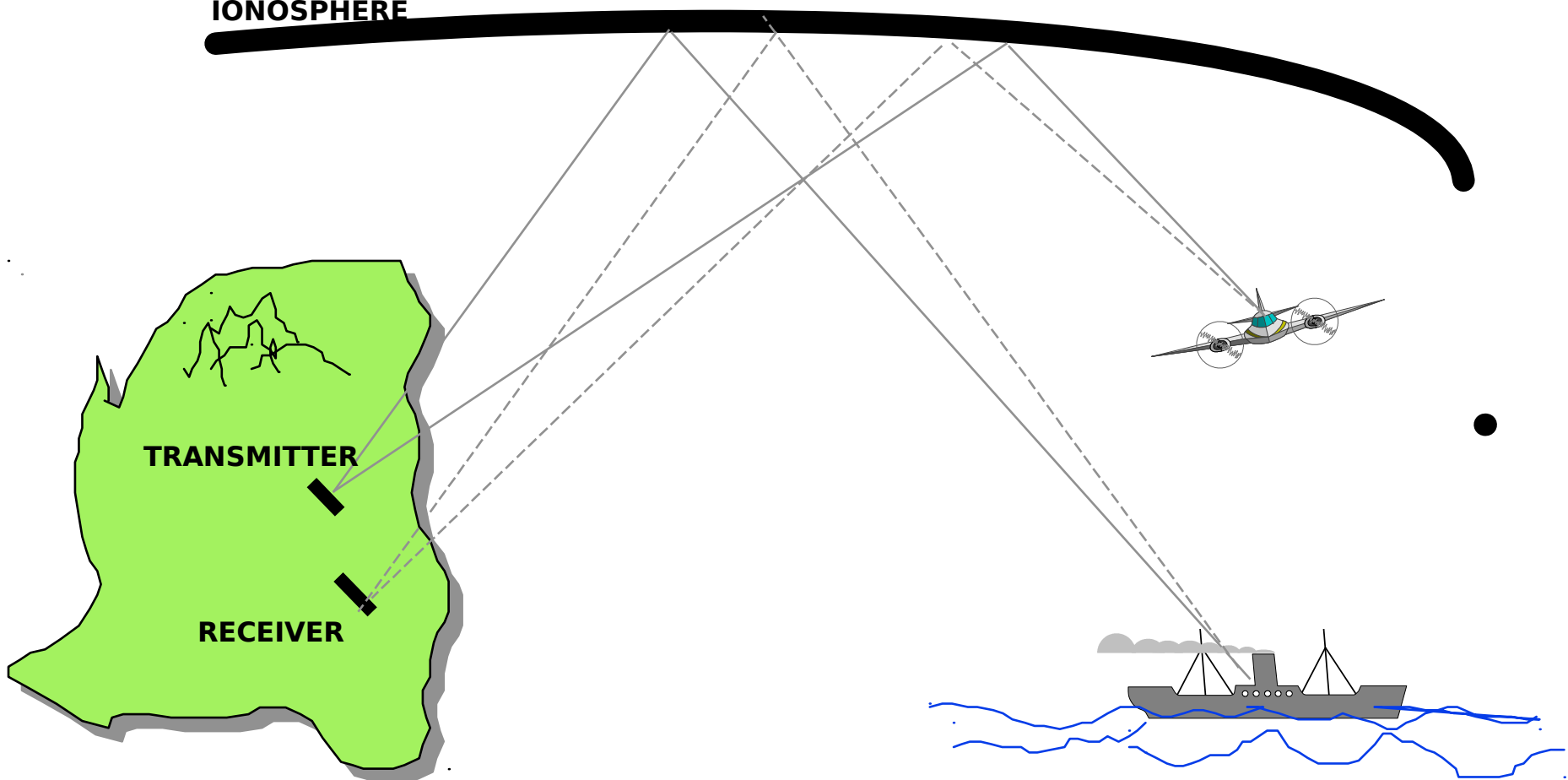
OTH RADAR

- **PROVIDES WIDE-AREA AIRCRAFT DETECTION**
- **USES IONOSPHERE TO REFLECT RADAR SIGNALS**
- **CAN DETECT TARGETS AT ANY ALTITUDE**
- **NOMINAL TARGET DETECTION RANGE: 500-2000 MILES**



CONCEPT OF OPERATIONS - OTH RADAR

IONOSPHERE





SYSTEM S

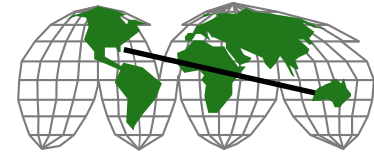
- **US AIR FORCE: OVER-THE-HORIZON BACKSCATTER (OTH-B) RADAR, AN/FPS-118**
- **US NAVY: RELOCATABLE OVER-THE-HORIZON RADAR (ROTHR) SYSTEM, AN/TPS-71**
- **AUSTRALIA: JINDALEE, JORN**



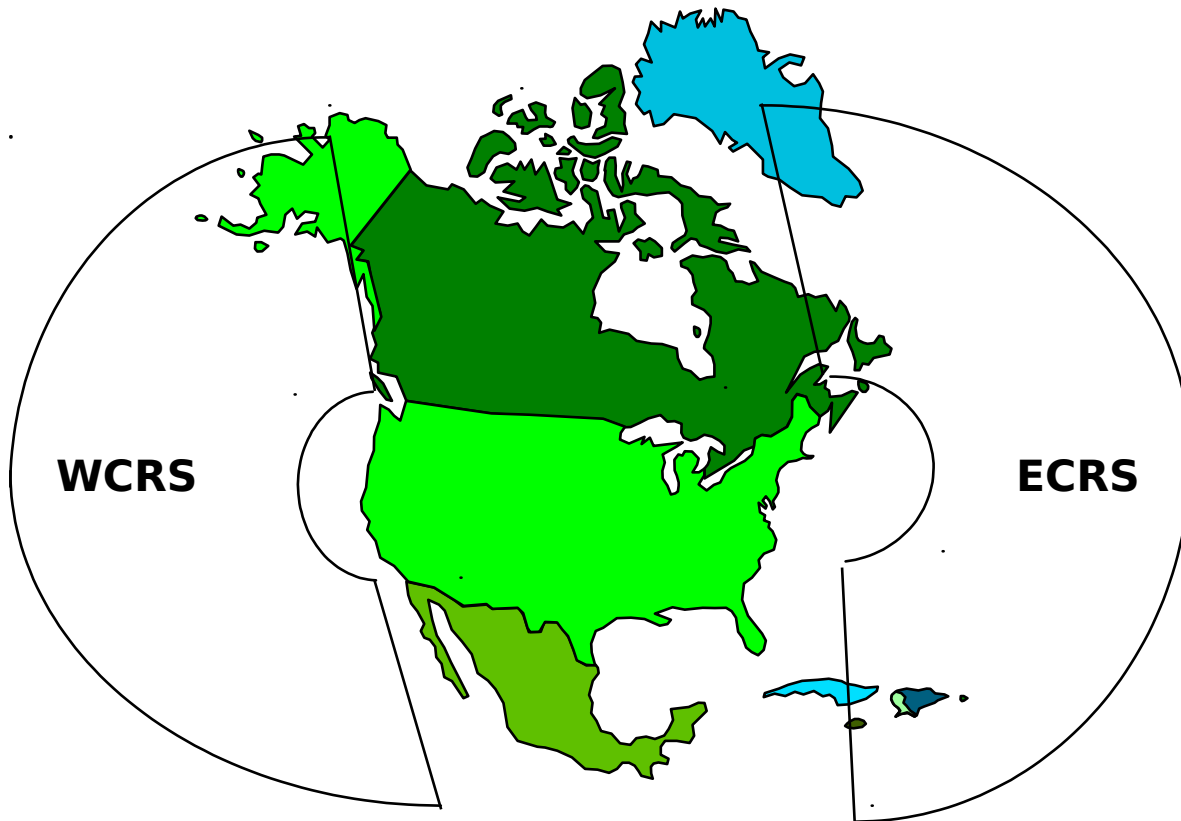
OTH-B

- **EAST COAST RADAR SYSTEM LOCATED IN MAINE, OPERATIONS CENTER IN BANGOR**
- **WEST COAST RADAR SYSTEM LOCATED IN PACIFIC NORTHWEST, OPERATIONS CENTER AT MOUNTAIN HOME AFB**
- **CURRENTLY IN COLD STORAGE**

□



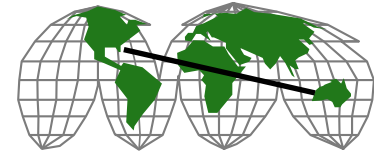
OTH-B COVERAGE



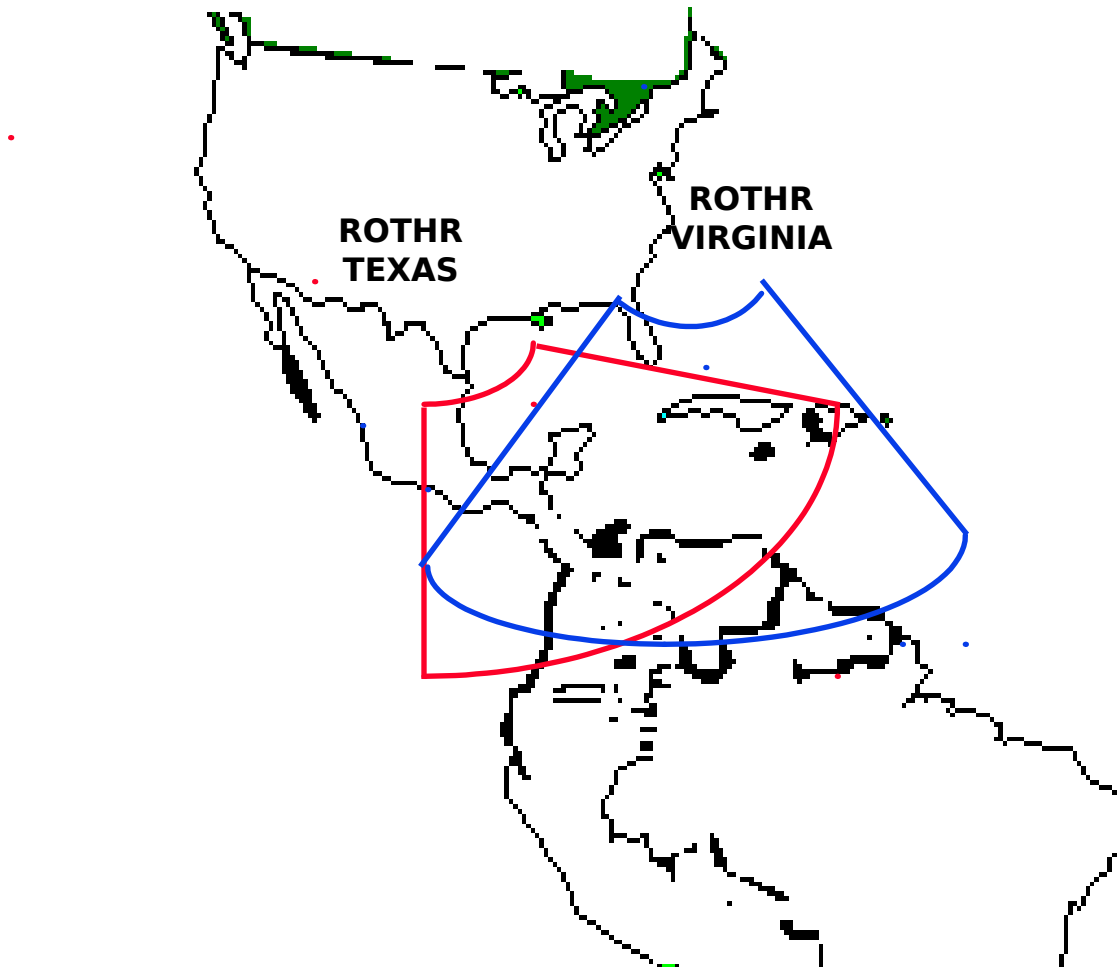


ROTHR

- **OPERATES 24 HOURS/DAY, 7 DAYS /WEEK**
- **SUPPORTS COUNTERDRUG (CD) OPERATIONS, USCINCLANT ESTABLISHED ROTHR AS KEY ELEMENT OF CD STRATEGY**
- **TWO OPERATIONAL SYSTEMS - VIRGINIA AND TEXAS**
- **THIRD SITE IN PUERTO RICO APPROVED**
- **INDIVIDUAL SECTOR OPERATIONAL CONTROL CENTERS (OCC) CONSOLIDATED INTO A SINGLE OCC IN VIRGINIA**

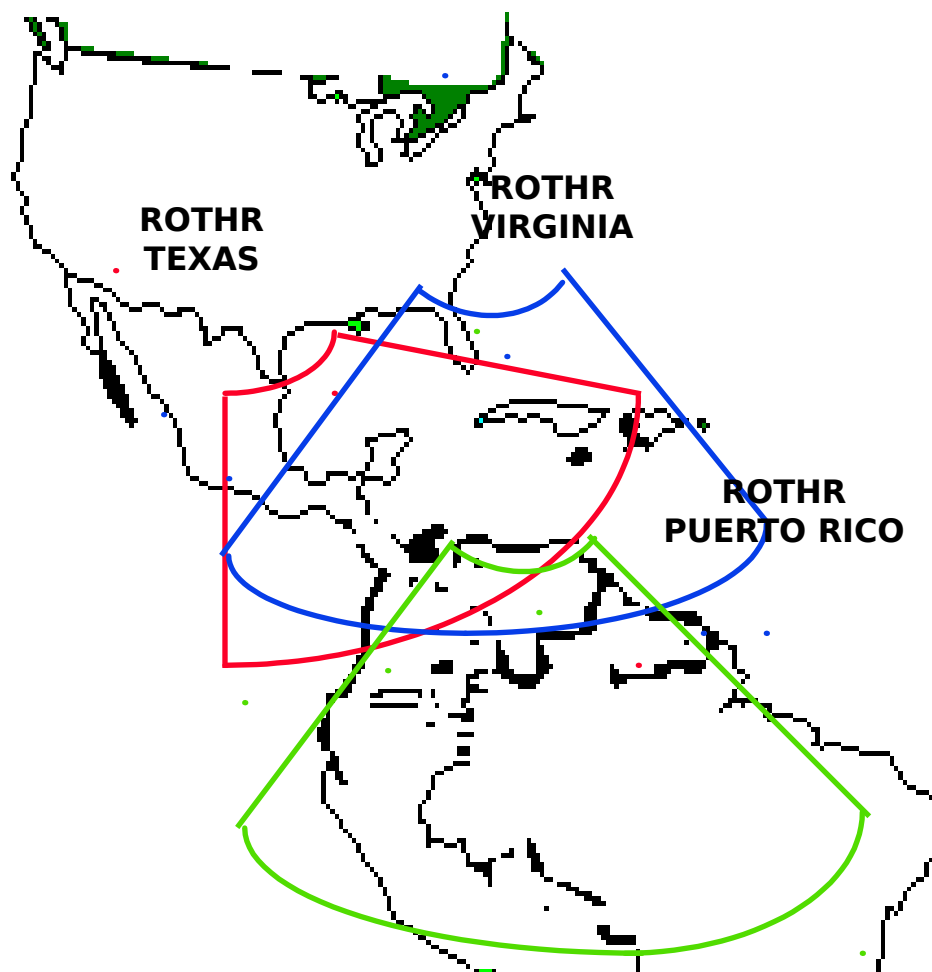


ROTHR COVERAGE





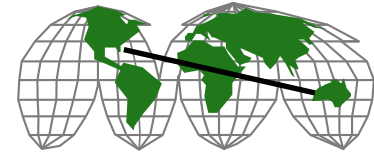
ROTHR COVERAGE PLANNED



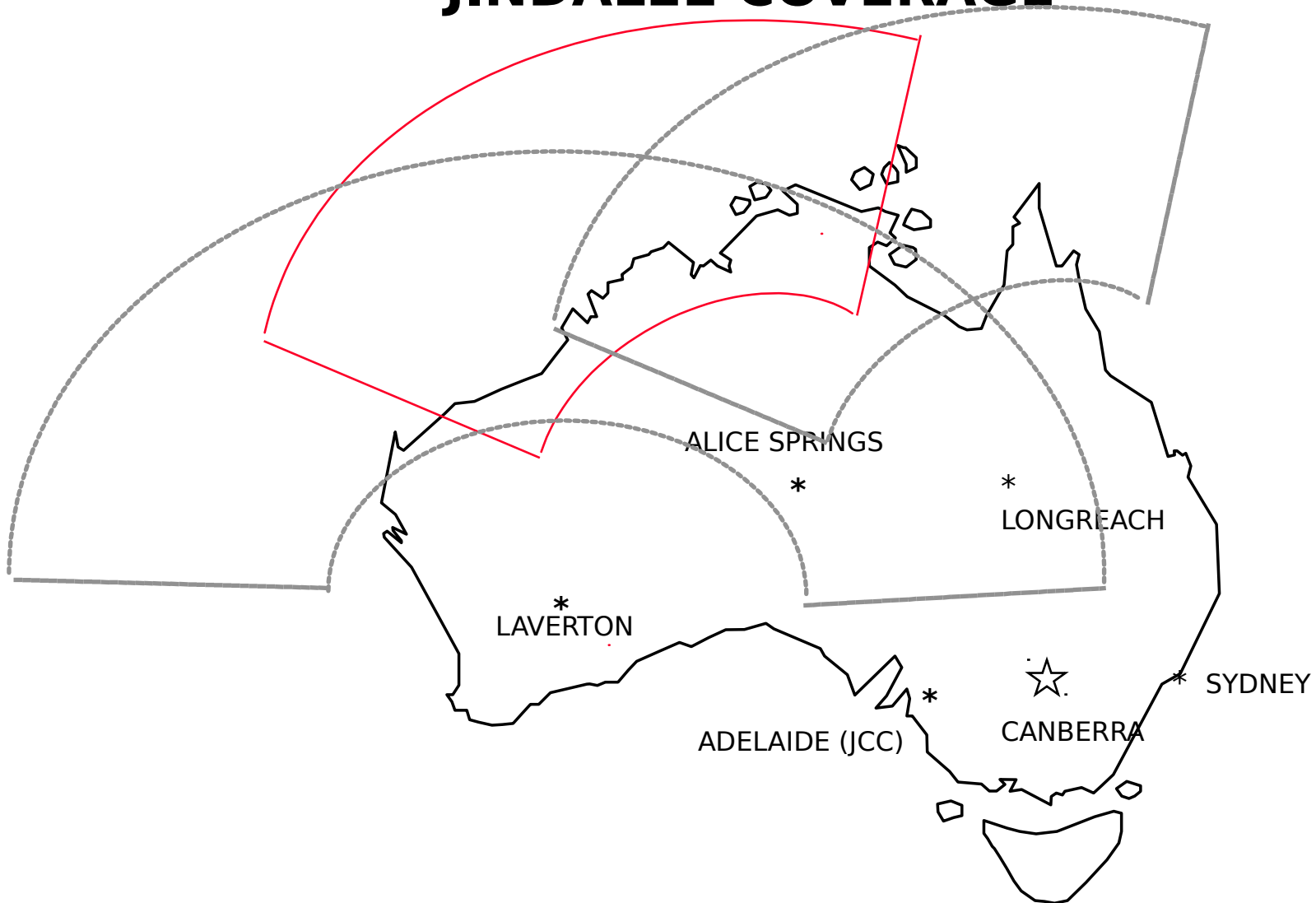


JINDALEE

- **LOCATED IN ALICE SPRINGS, NORTHERN TERRITORY**
- **OPERATIONAL SYSTEM - 16 HOURS DAILY**
- **ALSO USED AS EXPERIMENTAL SYSTEM BY DSTO**
- **OPERATED BY NO.1 RADAR SURVEILLANCE UNIT, RAAF**



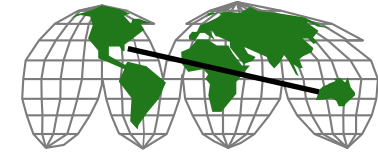
JINDALEE COVERAGE





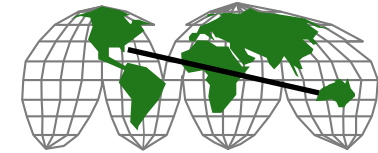
PROJECT

- **RADAR SYNTHETIC PERFORMANCE MODELING**
- **RESIDUAL CLUTTER IN RADARS**
- **DETECTION AND TRACKING OF TARGETS IN CLUTTER**
- **DATA FUSION FOR OTH RADARS**
- **COORDINATE REGISTRATION WITH OTH RADARS**
- **SYSTEM OPERATIONS FOR OTHR NETWORKS**
- **AUTOMATED RADAR MANAGEMENT SYSTEMS**
- **OTHR SYSTEM PERFORMANCE ASSESSMENT**
- **CLUTTER MITIGATION FOR OTHR SYSTEMS**



PROJECT ARRANGEMENTS

- **RADAR SYNOPTIC PERFORMANCE MODELING
(COMPLETED) --EVALUATION OF OTH RADAR
PERFORMANCE PREDICTION MODELS. DEVELOPMENT OF
IMPROVED PROPAGATION, CLUTTER, TARGET AND RADAR
MODELS TO SUPPORT CURRENT AND FUTURE
OPERATIONAL OTH RADAR MISSIONS**
- **RESIDUAL CLUTTER IN OTH RADARS (COMPLETED)
--STUDY OF NEW RESIDUAL
CLUTTER DATA AND ANALYSIS TO ENHANCE THE
DETECTION AND TRACKING CAPABILITY OF OTH RADAR**



PROJECT ARRANGEMENTS

- **DETECTION AND TRACKING OF TARGETS IN CLUTTER**

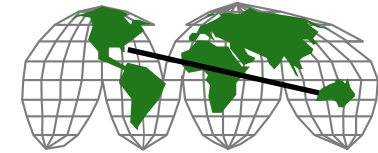
--

EXPLORE AND DEVELOP IMPROVED OTH RADAR TARGET TRACKER TO DETECT AND TRACK SMALL, SLOW MOVING TARGETS IN CLUTTER

- **DATA FUSION FOR OTH RADARS (COMPLETED)**

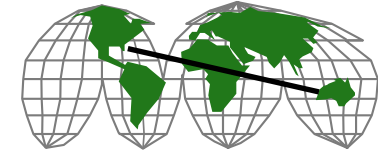
-- DEVELOP AND EVALUATE

DATA FUSION TECHNIQUES FOR A NETWORK OF OTH RADAR SENSORS HAVING OVERLAPPING COVERAGE. DEVELOP AND TEST SOFTWARE AND HARDWARE IMPLEMENTATIONS OF CANDIDATE DATA FUSION TECHNIQUES



PROJECT ARRANGEMENTS

- **COORDINATE REGISTRATION WITH OTH RADARS**
-- DEVELOP
**AND EVALUATE TECHNIQUES TO PERFORM
COOPERATIVE TARGET IDENTIFICATION USING OTH
RADAR SIGNALS**
- **SYSTEM OPERATIONS FOR OTHR NETWORKS**
-- WILL FOCUS ON
**THE OPERATIONAL ASPECTS OF OTH RADARS
INCLUDING TACTICS DEVELOPMENT, NETWORK
OPERATIONS, AND TRAINING**
- **AUTOMATED RADAR MANAGEMENT SYSTEM (ARMS)**
-- DEVELOP AND EVALUATE
**AN ARMS. SOFTWARE AND HARDWARE
IMPLEMENTATION OF AUTOMATED RADAR**



PROJECT ARRANGEMENTS

- **OTHER SYSTEM PERFORMANCE ASSESSMENT**
 - **VALIDATE VARIOUS MODELS OF SYSTEM PERFORMANCE BY DISCERNING THE RELATIONSHIP BETWEEN PERFORMANCE AND THE SURVEILLANCE REGION, TIME OF DAY, SEASON, AND LEVEL OF SOLAR ACTIVITY**

- **CLUTTER MITIGATION FOR OTHER SYSTEMS**
 - **IDENTIFY AND EVALUATE MECHANISMS, ALGORITHMS, AND APPROACHES TO DETECT AND MITIGATE THE EFFECTS OF CLUTTER FROM ALL SOURCES AND RANGES**